including all of the elements of the claims from which each originally depended. Claims 1, 2 and 10 have been amended to more specifically set forth the features of Applicant's invention. New claims 11-14 have been added to claim Applicant's invention in a different form.

In view of the amendments to the claims and for the reasons set forth below, it is respectfully submitted that Applicant's invention as set forth in claims 1, 2 and 10, and new claims 11-14, includes features which are not suggested or rendered obvious by the cited references, as combined by the Examiner. Reconsideration is, therefore, respectfully requested.

Besides amending claims 3, 5, 7 and 9 to independent form, such claims have been amended to utilize the term "video recording means" for the term "a video tape recorder". It is submitted that the term "video recording means" broadly includes a video tape recorder and thus is within the scope of the present invention. Further, it is submitted that the use of this term does not change the subject matter of claims 3, 5, 7 and 9 which the Examiner has already indicated as containing allowable subject matter.

Similarly, the term "a video tape recorder" in claim 1 and the step of recording the video signals in claim 10 have been revised to "video storing means for storing a composite signal" and "storing the video signals". It is submitted that such language is commensurate with the scope of the present invention and that a video tape recorder can broadly be defined as a video storing means. Thus, it is respectfully submitted that the use of the new terms noted above do not interject new subject matter into the application.

Claims 1, 2 and 10 are rejected under 35 U.S.C. 103 as being unpatentable over Conway in view of Williams. The Examiner states that Conway discloses in his eighth and ninth embodiments in Figure 10 time and video-generated data to be played back with time-position

control data, for robot control. The Examiner contends that although Conway uses memory storage, it would have been obvious to use any suitable storage for such playback, as in Williams, who uses video tape including associated time code data. The Examiner further contends that such medium is typically used with camera-generated input and would include frame period sequences.

However, it is respectfully submitted that Conway and Williams are not combinable in the manner posed by the Examiner such that it cannot be said that Conway and Williams suggests or renders obvious Applicant's invention as set forth in claims 1 and 10, and claim 2 which depends from claim 1.

Briefly, Conway discloses a system and method for performing tele-operations with the active assistance and supervision of a human being who generates a future path plan in real time for immediate use by an automated on-line controlled agent, such as a robot or other manipulator. In the relevant embodiments cited by the Examiner, Conway employs a joystick to generate positional commands to a remote robot. In a forward simulation mode, the commands alter a display on a monitor to indicate a future path of movement of the robot. The same signals, which were stored in a buffer, can then be transferred directly to the robot to implement the simulated path.

However, Conway lacks any teaching of providing a video time code synchronized robot control apparatus as set forth by the Applicant in claims 1 and 2. Conway lacks any teaching or suggestion of synchronizing the generation of video signals on a frame-by-frame basis with time code information for each frame so as to enable the playback of the video signals to be synchronized with the movement of the robot arm on a frame-by-frame basis. This insures that the robot arm follows the same path as it did when the video signals from the video camera mounted on the robot arm were initially generated.

Conway also lacks any teaching of mounting a video camera directly on the arm of a robot to record images during movement of the robot arm along a predetermined path. Rather, Conway utilizes the video camera to record images of the position of the elements of the robot itself while executing its programmed path of movement. Conway specifically lacks any teaching or suggestion of synchronizing the generation of video signals from a recording medium, which video signals were previously stored on the recording medium during movement of a video camera mounted on a robot arm moving through a path of movement, with movement of the robot arm.

Since Conway lacks any teaching or suggestion of employing synchronization of any kind between the stored video images and the movement of the robot arm as the video images are played back, it is submitted that it would not be obvious to employ the video interval time code reading and writing system of Williams in the system of Conway since there is no suggestion in Conway for such synchronization or the use of time codes to synchronize the path of movement of the robot with video signals on a frame-by-frame basis as the recording medium on which the video signals are stored generates such stored video signals. The input commands from the joystick in Conway in the forward simulation more are stored in a buffer and displayed on the video monitor. If the user is satisfied with the simulated path of movement, the stored commands are then output to the robot for execution. Conway does not coordinate playback of the video signals with the movement of the robot as in Applicant's invention set forth in claim 1.

For these reasons, it is respectfully submitted that Applicant's invention as set forth in claim 1 includes features which are not suggested by a combination of Conway and Williams as posed by the Examiner.

Claim 2 depends from claim 1 to include all of the features thereof and to set forth an additional specific embodiment of Applicant's invention. In claim 2, Applicant's invention is further defined as comprising a monitor means which displays video images from one of the video camera or the composite image recorded on the recording medium. The monitor means in Applicant's invention is not employed to generate a future simulated path of movement; but is employed only to display the video images generated by the video camera or video images previously stored on the recording medium.

It is further submitted that Applicant's invention as set forth in claim 10 which describes a method of generating video images is not suggested or rendered obvious by Conway and Williams as combined by the Examiner. Specifically, Conway lacks any teaching or appreciation of storing the position coordinates of the robot arm along the predetermined path of movement of the arm for each distinct video signal frame identification information assigned to a video signal on a frame-by-frame basis as the video signal is first generated. Conway merely stores position data generated by a joystick, which positional data may be generated in a future simulation mode prior to execution by the robot. This position data is coordinate information defining the path of movement of the robot and has no relationship or synchronization with video time code information.

Further, Conway lacks any suggestion of synchronizing the movement of the robot arm along the predetermined path of movement with the video signal frame identification information during the generation of video signals from a recording medium such that the arm of the robot is positioned by the robot controller in the same position for each frame of video signal as when each frame of video signal was initially generated by the video camera. As noted above, the camera in Conways system merely records images of the path of movement of

the robot arm and is not attached to the arm itself.
Thus, Conway lacks any suggestion of storing the
positional coordinates of the robot arm on a frame-by-
frame basis in synchronization with the video signal
frame identification information assigned to each frame
of video signal as recorded by a video camera and
generated by a time code generator as set forth by the
Applicant in claim 10. In view of this lack of
synchronization of movement of the robot arm with
recorded video signals on a frame-by-frame basis in
response to frame identification information assigned to
each frame of video signal, it is respectfully submitted
it would not be obvious to employ the vertical interval
time code system of Williams in Conway to form a method
of generating video images as set forth by the Applicant
in claim 10. As such, it is respectfully submitted that
Applicant's method as set forth in claim 10 patentably
defines over the cited references as combined by the
Examiner and is not taught, suggested or rendered obvious
thereby.

New claim 11 has been added to further define
the video signal frame identification information of
claim 10. In claim 11, the video signal frame
identification information is more specifically defined
as time code information. It is respectfully submitted
that Applicant's description supports the use of the term
"video signal frame identification information" since
time code information can be generally defined as a video
signal frame identification information since it is a
unique address or identification code for each frame of
video signal generated by a video camera or generated
during the playback of such information from a storage
medium.

New claims 12-14 have been added to define
Applicant's invention in a broader form. It is submitted
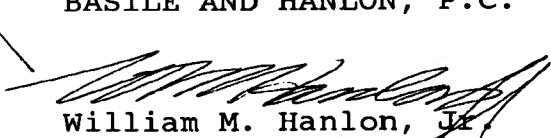that Applicant's specification fully supports the method

steps set forth in claims 12-14 such that claims 12-14 do not add new subject matter to the subject application.

Further, it is respectfully submitted that claims 11-14 patentably define over the combination of Conway and Williams since the cited references are devoid of any teaching or suggestion of using time code or, more generally, video signal frame identification data, to synchronize movement of a robot arm in a path of movement with stored video signals. Conway utilizes position coordinates to control the robot and is devoid of any synchronization between the video images on the monitor and the path of movement of the robot.

In summary, claims 1, 2 and 10 have been amended to more specifically define the features of Applicant's invention. New claims 11-14 have been added to claim Applicant's invention in a different combination. For the reasons set forth above, it is respectfully submitted that Applicant's invention as set forth in claims 1, 2 and 10 and new claims 11-14 include features which are not taught or suggested by the cited references. Thus, claims 1, 2, 10, and 11-14 are submitted to be in condition for allowance, along with claims 3-9 which the Examiner has previously indicated were allowable. A Notice of Allowance is submitted to be warranted and is respectfully requested.

Respectfully submitted,

BASILE AND HANLON, P.C.

William M. Hanlon, Jr.
Attorney for Applicant
Registration No. 28422
(313) 649-0990

1650 West Big Beaver Rd., Suite 210
Troy, Michigan 48084-3515

Dated: March 11, 1993
WMH/tlk